

MOLYBDENUM ALLOY X-RAY TARGETS HAVING
UNIFORM GRAIN STRUCTURE

ABSTRACT OF THE DISCLOSURE

The invention relates to a process for making a cross-directionally worked molybdenum plate, the process comprising: (a) reducing ammonium molybdate and forming molybdenum metal powder; (b) consolidating a molybdenum component comprised of molybdenum metal powder and an alloying element to a first workpiece, the alloying element being selected from the group consisting of titanium, zirconium, hafnium, carbon, lanthanum oxide, and combinations thereof; (c) thermally treating the first workpiece and subjecting the workpiece to thermo-mechanical forces in a first direction, and thereby forming a second workpiece; (d) thermally treating the second workpiece and subjecting the second workpiece to thermo-mechanical forces in a second direction that is different from the first direction; (e) subjecting the thermomechanically treated second workpiece to a recrystallization heat treatment step, and thereby forming a heat-treated crossdirectionally worked workpiece; and (f) subjecting the heat-treated, cross-directionally worked workpiece to a slicing step or a machining step, and thereby forming the cross-directionally worked molybdenum plate. The invention also relates to X-ray targets made from the process.